

DOCUMENT RESUME

ED 204 166

SE 035 277

AUTHOR Haladyna, Tom
TITLE A Statewide Survey of Teachers of Mathematics--Oregon
1976-77.
INSTITUTION Oregon State System of Higher Education, Monmouth.
Teaching Research Div.
PUB DATE Jul 77
NOTE 69p.
AVAILABLE FROM Greg Thomas, Teaching Research, Oregon College of
Education, Monmouth, OR 97361 (\$2.00).
EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS Educational Research; Elementary Secondary Education;
*Inservice Teacher Education; Mathematics Curriculum;
*Mathematics Education; Mathematics Instruction;
*Mathematics Teachers; School Surveys; *State
Surveys; Surveys; *Teacher Attitudes
IDENTIFIERS *Mathematics Education Research; *Oregon System of
Mathematics Education

ABSTRACT

This report focuses on determining the effect of five years of the Oregon System of Mathematics Education (OSME) on teachers and their teaching practices. The instrument, first used in 1974-75, was administered to nearly 5,000 teachers of mathematics in Oregon. Minor changes were made in the questionnaire to obtain more information about instructional resources as well as the availability and student use of calculators and computers. The follow-up survey was designed so that comparisons could be made with the first survey to see if substantial shifts had occurred in any of the measured factors. In addition to presenting and discussing the second survey's results, the report makes two major conclusions: (1) OSME has made a significant impact on teachers in Oregon; and (2) Those teachers who are most likely to participate in OSME and most likely to profit from OSME experiences are typically mathematics instructors who would be recognized as outstanding or better than average. A copy of the 30-item instrument used is included in this report. (MF)

* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *

ED 204166

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY.

"PERMISSION TO REPRODUCE THIS
MATERIAL HAS BEEN GRANTED BY

TOM HALADYNA

TO THE EDUCATIONAL RESOURCES
INFORMATION CENTER (ERIC)."

A STATEWIDE SURVEY OF TEACHERS OF MATHEMATICS - OREGON 1976-77

Tom Haladyna
Teaching Research
Oregon State System of Higher Education

July, 1977

TEACHING RESEARCH

A Division of the Oregon State System of Higher Education

SE 035 277

A Statewide Survey of Teachers of Mathematics

Oregon 1976-77

Tom Haladyna

Teaching Research

Oregon State System of Higher Education

ACKNOWLEDGEMENTS

This writer is indebted to Greg Thomas and Casper Paulson for their editorial assistance and to Linda Chevraux and Penny Lane for their invaluable preparation of this final report. Any inaccuracies or other faults in this report, however, are the sole responsibility of the writer.

Tom Haladyna
Monmouth, Oregon
July, 1977

A STATEWIDE SURVEY OF TEACHERS OF MATHEMATICS 1976-77

SUMMARY

Introduction

A survey was conducted in FY 1974-75 of all Oregon teachers of mathematics to determine the effect of three years of the Oregon System of Mathematics Education (OSME) on these teachers and their teaching practices (Haladyna, 1975). It was estimated that nearly 70% of all math teachers had, in some way, participated in OSME-sponsored activities and in contrast to non-OSME participants, OSME participants were more active in inservice activities, more experienced in classroom teaching, and more professionally involved in organizations and the reading of math periodicals. However, OSME teachers did not seem to be different than non-OSME teachers with respect to actual classroom teaching practices.

The survey conducted in FY 1976-77, in the fifth year of OSME, was planned to determine the impact of OSME after five years of operation (as well as to determine differences in results between the Year III and Year V surveys.) Another report will deal with analyses of these differences.

The same instrument used in FY 1974-75 was administered to nearly 5,000 teachers of mathematics in Oregon in FY 1976-77. Minor changes were made in this questionnaire to obtain more information about instructional resources as well as the availability and student use of computers and calculators.

Sample and Population

In the first survey, FY 1974-75, there was some doubt about the nature of the sample and the way the OSME participants were identified. Consequently, in the present survey (FY 1976-77), two separate samples representing OSME participants were identified and used for the comparisons with non-OSME teachers. Overall, a more thorough sample of Oregon teachers was accomplished by broadening the sample to include areas of Oregon not sampled in the previous survey.

Results

About 61% of all elementary and 74% of all secondary teachers in the FY 1976-77 survey were identified as participating in OSME in some way. A comparison of OSME and non-OSME teachers revealed that OSME teachers:

1. have slightly more teaching experience;
2. have more inservice experience in math;
3. have considerably more undergraduate and graduate training in mathematics;
4. were more often members of OCTM;
5. read math periodicals with greater frequency;

6. were more familiar with OSME and OMEC;
7. were positively disposed toward their OSME and OMEC experiences;
8. appeared to implement in their classroom teaching what they had been exposed to as a result of their OSME inservice experience.

Of all the conclusions listed above, #8 bears the most attention. Of the 23 possible responses teachers could have made regarding how they teach math, seven of these can be directly tied to OSME, and six of these seven showed sizable differences in favor of OSME teachers. That is to say, OSME teachers appear to be using math games and lab materials (manipulatives) with greater frequency than their non-OSME counterparts.

A further analysis was conducted within the sample of OSME teachers to find which sub-group of these teachers found OSME most profitable and what distinguishing characteristics these teachers possess. Two groups were identified, those finding OSME most useful and those finding OSME least useful. These two groups were then compared on all variables of the study. The findings essentially replicated those of the study conducted during FY 74-75. Teachers finding OSME most useful were more experienced, better educated in mathematics, more professionally involved, more willing to use instructional resources, and much more willing to use math games and manipulatives in their teaching.

Two conclusions appeared justified by the findings of this survey:

1. There is little doubt that OSME has made a significant impact on teachers in Oregon. A great many have made changes in their teaching practices which can be traced back to OSME inservice experiences. The value or worth of these changes cannot be evaluated with the present data, but the extent to which OSME has made changes in teaching style can, and all indicators point to changes in the direction of innovative teaching as exemplified in math games and manipulatives.

2. Those teachers who are most likely to participate in OSME and most likely to profit from their OSME experiences are typically math teachers who would be recognized as outstanding or better-than-average. This exclusive group of teachers, who find OSME most useful, are more experienced, better educated, more professionally involved, more active in inservice activities, more aware of innovation, willing to take more inservice classes, and able to enact changes in their teaching style which reflect the philosophy of OSME. In effect those teachers who are likely to be identified as outstanding in a number of ways are most likely to engage in inservice activities and profit from their experience. Other teachers have a tendency to remain intractable with respect to professional growth and have not been significantly affected by OSME other than to be simply made aware. In short, teachers most likely to seek help from OSME are often those least likely to need such help, while those in dire need are less likely to engage in OSME-sponsored activities; and if they do participate typically report little change in their teaching.

A STATEWIDE SURVEY OF TEACHERS OF MATHEMATICS

1976-77

INTRODUCTION

In the third year of OSME, 1974-75, a survey of teachers of mathematics in Oregon was conducted to ascertain the impact of OSME on these teachers and their teaching techniques. The study was also intended to provide information regarding the backgrounds and preservice and inservice experiences of OSME-project participants as well as non-participants (Haladyna, 1975). The results of that survey led to a number of conclusions:

1. OSME teachers were slightly older and more experienced, and most of these teachers taught at the junior high or high school level.
2. Considering preservice and inservice experiences in mathematics, OSME teachers were more involved in inservice workshops, had more undergraduate and graduate hours in math.
3. OSME teachers were distinctive with respect to their readership of math periodicals and OCTM membership.
4. When asked if they knew of OSME or OMEC, participant teachers were more often affirmative, and they were also more willing to participate in future workshops.
5. A major concern was whether OSME participant teachers taught differently than non-participants. Seven of the survey questions dealt with the use of computers, calculators, math games, math lab materials, and other indicators of impact on the part of OSME-sponsored activities. The comparisons between OSME and non-OSME participant teachers revealed little or no differences for these questions.

It appeared that while OSME-participant teachers were slightly more experienced and involved in mathematics education, they had not significantly changed in their approaches to instruction.

In the fifth year of OSME, 1976-77, a follow-up survey was conducted using the same items used in the earlier survey. This second survey would serve two useful purposes:

1. First, the impact of OSME on teachers and their teaching practices after the fifth year of OSME could be examined; and
2. Comparisons could be made from the first survey to the second survey to see if any substantial shifts had occurred in the factors that were measured in the survey.

In this report, the results of the second survey are presented and discussed. A third and final report will be completed by the end of the summer of 1977 which will present and discuss a comparison of findings from the Year III survey with the Year V survey.

WHAT DOES THE SURVEY INSTRUMENT MEASURE?

The instrument, shown in Table 1, was modified slightly from the one used two years earlier.¹ Table 2 contains a list of the factors of the study and representative questions. Factor 5 deals with the use of instructional materials and resources in the classroom instead of the impact of computer education.

¹ The question dealing with the computer usage on attitudes was found to be unproductive and was therefore replaced.

A SURVEY OF TEACHERS OF MATHEMATICS IN OREGON

FILL IN THE BLANK OR CHECK THE BOX WHERE APPROPRIATE.

1. Where did you obtain your undergraduate education?

☐ EOSC ☐ OCE ☐ OIT ☐ OSU ☐ PSU ☐ U of O ☐ SOSC
☐ Northwest private school ☐ Other Northwest school ☐ Other (specify) _____

2. To what degree did your preservice education prepare you to teach mathematics?

☐ quite well ☐ well ☐ adequately ☐ inadequately

3. How many years have you been teaching?

4. In how many of those years did you teach mathematics as a discipline or subject matter content?

5. At what grade level have you taught the most?

☐ primary grades ☐ intermediate ☐ junior high ☐ high school

6. What grade level are you presently teaching?

☐ primary grades ☐ intermediate ☐ junior high ☐ high school

7. How many years have you taught at that grade level (#6)?

8. How often do you teach mathematics?

☐ one period a day ☐ several times a day ☐ at least half of the school day ☐ full time

9. Over the years you have been teaching, what is your estimate of the average number of days each year that you have spent in inservice training in mathematics?

☐ less than one day ☐ one day ☐ two days ☐ more than two days

10. Approximately how many credit hours do you have in college math courses numbered:

☐ 100-200 (pre-calculus) ☐ 300-400 (calculus and beyond) ☐ 400-500 (graduate)

CHECK THE APPROPRIATE BOX.

YES NO
OPINION NO

- ☐ ☐ ☐ 12. In your opinion, in the district where you teach, are the resources and aids for teaching mathematics adequate?
☐ ☐ ☐ 13. Do you desire additional math resources (e.g., filmstrips, films, commercially-prepared materials)?
☐ ☐ ☐ 14. Do your students have a basic textbook in mathematics?
☐ ☐ ☐ 15. If yes, do the present mathematics textbooks need revision or replacement?
☐ ☐ ☐ 16. Are you a member of the Oregon Council of Teachers of Mathematics (OCTM)?
☐ ☐ ☐ 17. Do you read and/or use the Math Enthusiast, Arithmetic Teacher, Math Teacher, or OCTM Newsletter?
☐ ☐ ☐ 18. Have you ever heard of the Oregon System of Mathematics Education (OSME) or the Oregon Mathematics Education Council (OMEC)?

FOR ITEMS 19-29, CHECK ANY OF THE FOLLOWING ACTIVITIES FOR PROFESSIONAL IMPROVEMENT IN WHICH YOU HAVE PARTICIPATED AT ANY TIME DURING THE PAST THREE YEARS. ON THE RIGHT, RATE THE DEGREE TO WHICH YOU HAVE APPLIED OR USED THE IDEAS PRESENTED AT ANY PROFESSIONAL IMPROVEMENT ACTIVITY IN WHICH YOU PARTICIPATED.

PRESENTED AT ANY PROFESSIONAL IMPROVEMENT ACTIVITY IN WHICH YOU PARTICIPATED.			USEFULNESS			
			Very Much	Some	Little	Hardly at All
☐	19. Math Roundup	30.	☐	☐	☐	☐
☐	20. Inservice Math Workshop (during school year)	31.	☐	☐	☐	☐
☐	21. Inservice Math Workshop (during summer)	32.	☐	☐	☐	☐
☐	22. Math Enthusiasts Program	33.	☐	☐	☐	☐
☐	23. Oregon System of Mathematics Education (OSME) or Oregon Mathematics Education Council (OMEC) Workshop	34.	☐	☐	☐	☐
☐	24. Computer Workshop	35.	☐	☐	☐	☐
☐	25. Another In-State Workshop	36.	☐	☐	☐	☐
☐	26. Out-Of-State Conferences or Meetings	37.	☐	☐	☐	☐
☐	27. Took one or more courses for college credit in mathematics.	38.	☐	☐	☐	☐
☐	28. Took one or more courses for college credit in the teaching of mathematics.	39.	☐	☐	☐	☐
☐	29. Other	40.	☐	☐	☐	☐

YES MAYBE NO

41. Would you attend future inservice workshops or other activities designed to improve the teaching of mathematics?

42. Is there a math resource center in your local area? ☐ yes ☐ no ☐ don't know

IF YES:

43. Where is it located? ☐ College or University ☐ IED ☐ Local District ☐ Other _____

44. Do you utilize this center? ☐ yes ☐ no

MATH ACTIVITIES

This checklist has been designed to obtain estimates of how teachers and students are spending their time in activities related to the teaching and learning of mathematics. It may be difficult to make estimates on some of these. We appreciate your honesty and efforts in responding.

Below are math activities which are divided into three categories: (a) done by students only, (b) activities in which both the teacher and student are engaged, and (c) activities conducted by the teacher only.

Please read each of the questions on the right using the appropriate stem. As an example, "MY STUDENTS -- take tests or quizzes." Check the box on the left which best represents THE AMOUNT OF TIME SPENT EACH WEEK.

	Several Times a Week	Once a Week	Some- times	Never	
☐	☐	☐	☐	☐	MY STUDENTS
☐	☐	☐	☐	☐	1. take tests or quizzes.
☐	☐	☐	☐	☐	2. work on projects that may take several days to complete and may involve one or more students.
☐	☐	☐	☐	☐	3. do math games, games designed for the purpose of teaching some concept, skill or attitude.
☐	☐	☐	☐	☐	4. do seatwork using commercially-prepared materials, such as handouts or workbooks with no help given by me.
☐	☐	☐	☐	☐	5. do seatwork using teacher-made materials such as handouts with no help given by me.
☐	☐	☐	☐	☐	6. use computers or electronic calculators as part of their classwork.
☐	☐	☐	☐	☐	7. do homework assignments (work that must be done either at the student's home or during some school time not set aside or scheduled for mathematics class).
☐	☐	☐	☐	☐	8. work with manipulatives (math lab materials).
☐	☐	☐	☐	☐	MY STUDENTS AND I
☐	☐	☐	☐	☐	9. have oral presentations with the students involved as the audience.
☐	☐	☐	☐	☐	10. have oral presentations with students and myself involved as the audience.
☐	☐	☐	☐	☐	11. have class discussions with questions and answers.
☐	☐	☐	☐	☐	12. have seatwork with my help using commercially-prepared materials.
☐	☐	☐	☐	☐	13. have seatwork with my help using teacher-made materials.
☐	☐	☐	☐	☐	14. work together with manipulatives (math lab materials).
☐	☐	☐	☐	☐	15. work with manipulatives, with me demonstrating.
☐	☐	☐	☐	☐	16. see or work with audio-visual aids (filmstrips, movies, etc.).
☐	☐	☐	☐	☐	17. do math games (designed for the purpose of teaching some concept, skill or attitude in math which requires my help).
☐	☐	☐	☐	☐	18. work on projects that may take several days but require my help.
☐	☐	☐	☐	☐	I
☐	☐	☐	☐	☐	19. plan math classes or units of instruction for math class.
☐	☐	☐	☐	☐	20. prepare quizzes and tests for math class.
☐	☐	☐	☐	☐	21. prepare materials for students to use in seatwork or as homework.
☐	☐	☐	☐	☐	22. prepare math materials (such as games, manipulatives, lab exercises, etc.).
☐	☐	☐	☐	☐	23. correct, score, grade, or record homework, quizzes, or tests.
24. Are electronic calculators available for classroom use? ☐ yes ☐ no					
25. Are they available from					
the classroom ☐ yes ☐ no		number _____		the students ☐ yes ☐ no	
the building ☐ yes ☐ no		number _____		other ☐ yes ☐ no	
the district ☐ yes ☐ no		number _____		(specify) _____	
26. How often are they used in a class activity? _____ hr/wk					
27. How are they used? (Check as many as apply)					
☐ for class instruction			☐ outside of the regular classroom		
☐ an aid to drill and practice			☐ for any aspect of their math work they desire		
☐ to check their work/answers			☐ students must demonstrate ability prior to calculator use		
☐ in place of paper and pencil			☐ students are not allowed to use calculators		
28. Do your students have access to a computer? ☐ yes ☐ no					
29. IF YES, is it					
☐ district			☐ OTIS		
☐ tabletop			☐ other (where) _____		
30. How are they used? (Check as many as apply)					
☐ computer awareness			☐ information retrieval		
☐ programming skills			☐ other (specify) _____		

Table 2
Factors and Associated Questions of the
Survey Instruments

Factor Number	Factor Name and Description	Corresponding Survey Instrument Questions
1.	Current Status of Teachers of Mathematics in Oregon	3, 4, 5, 6, 7, 8
2.	Teachers' Satisfaction with Mathematics Resources and Instructional Materials	12, 13, 14, 15
3.	Preservice & Inservice Experiences (Non-OSME related)	1, 2, 9, 10, 25, 26, 27, 28, 36, 37, 38, 39, 41
4.	OSME Inservice Experiences	16, 17, 18, 19, 20, 21, 22, 23, 24, 30, 31, 32, 33, 34, 35
5.	Instructional Resources	42, 43, 44. Page 3: 24, 25, 26, 27, 28, 29, 30
6.	Classroom Activities of Teachers of Mathematics	Page 3: 1-23

DOES THE SAMPLE FAIRLY REPRESENT ALL TEACHERS IN OREGON?

Before considering the data from this mail survey questionnaire, it is important to ascertain if the sample does, indeed, represent the population of math teachers in Oregon. This is done by first considering the concepts of precision and bias in sampling as they apply to this survey.

The larger the sample, the higher the precision of the estimates obtained. Since there were over 4,000 respondents, representing about one-third of the total population sampled, the precision of the frequency of responses observed in this survey is quite high.

Bias is the difference between the values obtained representing the entire population and the values obtained from any sample of the population.

How well a sample of 4,652 teachers represents the total sample of over 12,000 teachers with respect to all measures obtained is difficult if not impossible to estimate. Large numbers would seem to suggest that representation is quite good. However, teachers who respond to questionnaires may not be similar to teachers who don't. Therefore, whenever considering a sample of questionnaire responses, one way to handle bias is to describe the sample obtained and compare their characteristics with the population's characteristics.

The sample of 4,652 teachers who responded to the mail survey represent all regions of Oregon, including the remote eastern parts as well as the metropolitan Portland area. A large number of elementary and secondary teachers were included in this sample. These teachers ranged widely on measures of experience and preservice and inservice education. In conclusion, it would seem that this sample is quite varied with respect to many of the variables of the study. The variability in response as well as background suggests that the sample is not biased to any large extent.

The survey conducted in Year III of OSME had several methodological issues and problems which required attention. First, a large portion of Portland Public School teachers were not surveyed in Year III due to errors in the computer tape containing that list of teachers. This deficit was remedied in the present survey. A second problem was the way in which OSME teachers were identified; they were given five categories to elect (see Questions 19-24), any of which represented various forms or names of OSME projects. There was an apparent lack of consistency in the way these categories were checked. A further analysis of these data suggested that many respondents checked more than one category when rating their inservice

experience. The net effect of these multiple responses was a seemingly unresolvable question, which respondents were in fact participants?

Finally, an attempt was made to obtain a list of all teachers in the state with the exception of Lane County where such lists do not exist. This was accomplished. Questionnaires for Lane County teachers were distributed with the cooperation of local administrators there, and that county was sampled. Therefore, the teachers sampled in this survey most nearly represented all teachers of math in Oregon.

In conclusion, no pockets of teachers were excluded from this survey, as had occurred in the first survey. The sampling procedures used, coupled with the high rate of responses, seem to suggest that these data are fairly representative of the population of teachers of math in Oregon, and that sample sizes are large enough so these estimates are sufficiently precise.

The populations sampled were:

1. "Special Sample OSME Teachers" - identified prior to the mailing of the survey and therefore independent of responses to Questions 19-24. This sample cannot, however, be considered unbiased.
2. "Lane County"
3. "OSME Teachers" - identified by responses to Questions 19-24.
4. "Non-OSME Teachers" - identified by responses to Questions 19-24.

WHAT WAS THE RESPONSE TO THE QUESTIONNAIRE?

Roughly 13,000 questionnaires were mailed to Oregon teachers. Of this number 9,901 were sent to elementary classroom and secondary math teachers, approximately 1,300 were sent to the special sample consisting of OSME inservice participants, and approximately 2,200 were sent to Lane County. The tabulations of respondents by elementary and secondary classifications is given in Table 3. As shown, the response was greatest in the

first mailing and considerably smaller in the second mailing. Both the special sample and Lane County sample had low response rates. An analysis of the Lane County data revealed no significant departures from what was observed in the total sample. The Lane County sample was therefore combined for purposes of analysis and reporting. The Lane County sample did not include secondary math teachers. As shown in Table 3, the majority of respondents were elementary school teachers.

Table 3
Extent of Responses to the
Survey Questionnaire

	Special Sample	Lane County	All Others		Total
			1st Mailing	2nd Mailing	
Elementary	265	236	2421	789	3210
Secondary	103	---	641	197	838
Total Returned	368	236	3062	986	4048
Total Sample	1303	2200	9901	6492	9901
Percentage Returned	28.2%	10.7%	30.9%	15.2%	40.9%

To summarize, the response rate was about 41% for the central list of teachers of math, less than 11% for Lane County and about 28% for the special sample of OSME teachers. While this is not as high as the last survey, it should be noted that the special sample is part of the major list. Therefore, there was some duplication which increased the number of non-respondents on the major list and no follow-up was possible for Lane County as well as the special sample.

HOW VALID ARE THE FIVE CATEGORIES OF OSME INSERVICE EXPERIENCES FOR IDENTIFYING OSME TEACHERS?

Questions 19 through 24 on page two of the survey instrument deal with categories of OSME inservice projects, and items 30 through 35 deal with ratings of the degree of usefulness of each of these inservice activities.

Due to the way OSME operates in the state, many teachers are not fully aware of the sponsorship of many projects and inservice activities.

Identifying an OSME workshop has been made quite difficult as a result. The attempt to provide five options to teachers for identifying themselves as OSME participant teachers has questionable validity.

The special sample of 1303 teachers, who were positively identified as having participated in OSME-sponsored activities, offers a two-way validity check. First, we can see if this sample responds with the same degree of consistency as the OSME teachers from the total sample. Second, if the teachers from the total sample who identify themselves as OSME participants are indeed OSME teachers, we would expect this sample to respond in about the same proportion of the five categories as the special sample. We would also expect to see about the same degree of overlap in checking among these categories.

As shown in Table 4, there were differences between the special sample and the OSME participant teachers sample with respect to the percentage of responses to Questions 19 to 24. These response differences were not observed to be in any pattern. At the elementary level, the special sample of teachers who were positively identified as OSME participants had a greater likelihood of checking the categories "Math Roundup," "Math Enthusiasts" and "OSME or OMEC Workshops." The pattern for secondary school teachers was slightly different. Both samples recognized OSME/OMEC with a high degree

of regularity, although the special sample clearly recognized OSME/OMEC with more frequency.

Table 4
Percentage of Teachers Sample Indicating
Participation In Two Inservice Activities¹

Question	Total Sample						Total OSME	
	19	20	Question 21	22	23	24	Elem.	Sec.
19. Math Roundup	--	4	1	1	1	0	10	37
20. Inservice Math Workshop (during school year)	14	--	7	4	5	2	77	65
21. Inservice Math Workshop (during summer)	7	11	--	1	2	1	19	25
22. Math Enthusiasts Program	4	5	2	--	1	0	10	10
23. Oregon System of Mathematics Education (OSME) or Oregon Mathematics Education Council (OMEC) Workshop	6	9	5	3	--	2	13	18
24. Computer Workshop	7	10	6	2	3	--	4	24
Total OSME Special Sample: Elem.	18	65	24	21	47	4		
Sec.	39	59	33	19	57	18		

¹ Above the diagonal is the total sample (n=3457). Below the diagonal is the special sample (n=896). All values are percentages.

As shown in Table 4, there was a slightly higher degree of overlap for the OSME special sample, and it was consistent across all possible 15 overlaps. Thus the special sample OSME participants were inclined to check OSME categories more often than OSME participants from the regular sample.

In summary:

1. The two samples show a different rate and pattern of response to items 19 to 24 which identify them as OSME participants.
2. These differences are minor at the secondary level, more pronounced at the elementary school level.

Since there is sufficient evidence to suggest that the two OSME samples are distinctive, subsequent analyses will treat the two samples separately.

HOW MANY TEACHERS IN THIS STATE HAVE PARTICIPATED IN OSME?

A simple count of the frequency of teachers who responded to the survey instrument will reveal how many teachers report participation in OSME activities and how many do not. The results are:

	Elementary		Secondary		Total	
OSME	1902	(61%)	560	(74%)	2462	(63%)
Non-OSME	1227	(39%)	196	(26%)	1423	(37%)
Total	3129	(100%)	756	(100%)	3885	(100%)

From this tabulation, it appears that 63% of all math teachers in the state have, in some way, participated in OSME activities, 61% of all elementary level teachers, 74% of all secondary school teachers.

WHAT IS THE CURRENT STATUS OF TEACHERS IN OREGON?

For each of the six factors (see Table 2) of the survey instrument, OSME and non-OSME teachers are compared at elementary and secondary school levels. The results relating to the status of math teachers in Oregon can be found in Table 5. As shown there, the following appears to be true about OSME teachers:

Table 5

A Comparison of OSME and Non-OSME Teachers

FACTOR 1: CURRENT STATUS OF TEACHERS OF MATHEMATICS IN OREGON

Question	<u>Elementary</u>			<u>Secondary</u>		
	Special Sample (n=265)	OSME Teachers (n=1902)	Non-OSME Teachers (n=1227)	Special Sample (n=103)	OSME Teachers (n=560)	Non-OSME Teachers (n=196)
3. How many years have you been teaching?						
average	10.6	9.3	7.8	12.2	11.9	9.5
range	0-39	0-55	0-55	1-35	0-55	0-55
4. In how many of those years did you teach mathematics as a discipline or subject matter content?						
average	8.3	7.2	5.8	10.5	9.7	7.6
range	1-39	0-54	0-54	0-29	0-55	0-54
8. How often do you teach mathematics?						
one period a day	88%	90%	92%	10%	13%	25%
several times a day	8%	8%	6%	9%	10%	17%
half day	1%	1%	1%	9%	14%	16%
full time	3%	1%	1%	72%	63%	42%

1. They are slightly more experienced than non-OSME teachers, particularly the special sample OSME teachers at the elementary level.

2. OSME teachers are also more experienced in teaching math, particularly those from the special sample, both elementary and secondary levels.

3. Elementary school teachers, regardless of sample, teach math about once a day; secondary school teachers from the OSME samples appear to teach math more often than non-OSME teachers.

4. It is interesting to note that a greater percentage of OSME teachers, from either OSME sample, are secondary school teachers (i.e., 28% of all special sample OSME teachers are secondary; 22% of all regular sample OSME teachers are secondary; 14% of non-OSME teachers are secondary).

HOW SATISFIED ARE TEACHERS WITH MATHEMATICS RESOURCES?

Tabulation for Questions 12, 13, 14, and 15, representing Factor 2, Teachers' Satisfaction with Mathematics Resources, can be found in Table 6.

These results indicate that:

1. Roughly a third of all elementary level teachers were dissatisfied with resources and all, and one-fourth of all secondary school teachers reported dissatisfaction.

2. Roughly one-third of all teachers indicated the need for math resources, with the secondary school non-OSME teachers showing the highest degree of need.

3. About 90% of all teachers use basal texts in math, but OSME teachers at both the elementary and secondary levels were slightly more inclined not to use a basal math text.

4. About one-fifth of all teachers, regardless of sample origin or level, indicated the need for new texts.

Table 6

A Comparison of OSME and Non-OSME Teachers

FACTOR 2: TEACHERS' SATISFACTION WITH MATHEMATICS RESOURCES

Question	Elementary			Secondary		
	Special Sample (n=265)	OSME Teachers (n=1902)	Non-OSME Teachers (n=1227)	Special Sample (n=103)	OSME Teachers (n=560)	Non-OSME Teachers (n=196)
12. In your opinion, in the district where you teach, are the resources and aids for teaching mathematics adequate?						
yes	59	69	61	70	70	58
no opinion	4	4	8	7	6	12
no	37	27	31	23	24	30
13. Do you desire additional math resources (e.g., filmstrips, films, commercially-prepared materials)?						
yes	65	58	59	64	55	49
no opinion	5	7	8	4	7	11
no	30	35	33	32	38	40
14. Do your students have a basic textbook in mathematics?						
yes	88	88	91	90	94	95
no opinion	--	--	--	--	--	--
no	12	12	9	10	6	5
15. If yes, do the present mathematics textbooks need revision or replacement?						
yes	77	72	76	71	71	76
no opinion	4	5	4	2	6	4
no	19	23	20	27	23	21

Overall, there was little indication of OSME/non-OSME differences with respect to teachers' satisfaction with math resources.

HOW DO OSME AND NON-OSME TEACHERS COMPARE ON PRESERVICE AND INSERVICE EXPERIENCES WHICH ARE NOT RELATED TO OSME?

A number of questions in the survey dealt with the preservice and inservice experiences of teachers. Results relating to the location and ratings of adequacy of preservice education are presented in Tables 7 and 8. These data include the school from which the teachers graduated and the rating of the adequacy of their math education preparation.

Elementary School. As shown in Table 7:

1. Most teachers were trained at state public institutions, roughly two of every three, with most coming from OCE, the fewest from OIT.
2. There were no significant differences between OSME and non-OSME samples with respect to where teachers were educated.
3. Rating of adequacy of preservice training in math revealed that most state institutions were doing well, but teachers trained at "Northwest Private Schools," "Other Northwest Schools," and "Schools Outside the Northwest" were doing better.

Secondary School. As shown in Table 8:

1. About 47% of special sample OSME teachers, 59% of OSME regular sample teachers, and 58% of non-OSME teachers were trained in state colleges and universities.
2. Although OSME and non-OSME teachers were fairly similar in where they were educated, special sample OSME teachers tended more often to be graduates of PSU and Northwest Private Schools and tended less often to be graduates of OCE.

Table 7

Proportion of Sample and Ratings by Teachers of the Adequacy of
Their Preservice Experience - Elementary School Teachers

School Category	Special Sample % Attended (n=265)	Lane County % Attended (n=236)	Regular Sample % Attended		Quite Well 4	Ratings of Adequacy			Average
			Non-OSME (n=1227)	OSME (n=1902)		Well 3	Adequately 2	Inadequately 1	
1. Eastern Oregon State College	7	2	6	8	12	21	52	15	2.30
2. Oregon College of Education	18	11	22	20	8	26	44	21	2.22
3. Oregon Institute of Technology	0	-	0	0	9	26	4	44	2.00
4. Oregon State University	12	6	12	11	6	17	36	30	1.98
5. Portland State University	9	2	8	8	18	12	48	20	2.29
6. University of Oregon	5	40	9	7	12	23	49	16	2.30
7. Southern Oregon State College	9	4	9	10	6	19	56	19	2.11
8. Northwest Private Schools	9	4	7	8	19	24	44	13	2.49
9. Other Northwest Schools	4	3	5	6	18	24	47	12	2.47
10. Schools Outside the Northwest	26	28	22	22	18	26	43	14	2.423

¹ Only 8 persons indicated attending OIT from the regular sample.

Table 8

Proportion of Sample and Ratings by Teachers of the Adequacy of
Their Preservice Experience - Secondary School Teachers

School Category	Special Sample % Attended (n=265)	Lane County % Attended (n=236)	Regular Sample % Attended		Quite Well 1	Ratings of Adequacy			Average
			Non-OSME (n=560)	OSME (n=196)		Well 3	Adequately 2	Inadequately 1	
1. Eastern Oregon State College	7	-	7	8	12	14	55	19	2.19
2. Oregon College of Education	12	-	16	12	13	17	48	22	2.22
3. Oregon Institute of Technology	-	-	2	1	21	36	14	14	2.75
4. Oregon State University	5	-	17	16	8	12	53	24	1.97
5. Portland State University	14	-	8	8	6	8	52	34	1.87
6. University of Oregon	4	-	4	9	4	15	50	31	1.93
7. Southern Oregon State College	6	-	5	4	8	12	54	26	2.03
8. Northwest Private Schools	21	-	12	11	13	24	39	23	2.28
9. Other Northwest Schools	4	-	6	7	14	17	46	23	2.21
10. Schools Outside the Northwest	28	-	23	24	14	18	49	19	2.27

¹ Only 12 persons indicated attending OIT from the regular sample.

3. Ratings of adequacy of preservice training in math were highest among EOSC, OCE, Northwest Private Schools, Other Northwest Schools, and Schools Outside the Northwest.

Overall, state schools were more likely to be rated as "inadequate" while other Northwest schools, including private schools, and schools outside the Northwest appeared to earn higher ratings from their graduates. A high percentage of teachers, particularly at the secondary level, were not trained in state-supported institutions.

Preservice and Inservice Activities. Questions relating to these activities included 9, 10, 25 to 28, and 41. Tabulations for these questions for elementary and secondary teachers are presented in Table 9 for the special sample OSME teachers, regular sample OSME teachers, and non-OSME teachers. These results indicate that:

1. Special sample OSME teachers tend to spend more time in inservice activities than the other two samples.

2. Elementary level OSME teachers tended to have more credit hours than non-OSME teachers at the 100-200 level, but these differences were not observed at the 300-400 level courses or graduate level courses. At the secondary school level, OSME teachers tended to have significantly more credit hours than non-OSME teachers.

3. Most teachers in the elementary school had no coursework at the 300-400 level or beyond. At the secondary level, 56% of all non-OSME teachers did not take courses at the graduate level.

4. In general, OSME teachers participated in workshops and courses more often than non-OSME teachers and tended to give more favorable ratings to these activities.

Table 9

A Comparison of OSME and Non-OSME Teachers

FACTOR 3: PRESERVICE AND INSERVICE EXPERIENCES
(NON-OSME RELATED)

Question	<u>Elementary</u>			<u>Secondary</u>		
	Special Sample (n=265)	OSME Teachers (n=1902)	Non-OSME Teachers (n=1227)	Special Sample (n=103)	OSME Teachers (n=560)	Non-OSME Teachers (n=196)
9. Over the years you have been teaching, what is your estimate of the average number of days each year that you have spent in inservice training in mathematics?						
less than one day	21	30	69	16	17	53
one day	20	25	13	26	26	20
two days	13	14	8	16	21	10
more than two days	46	30	10	42	35	16
10. Approximately how many credit hours do you have in college math courses numbered 100-200 (calculus)?						
median	4.5	3.1	2.8	9.5	10.0	8.0
range	0-36	0-80	0-55	0-50	0-80	0-54
numbered 300-400 (calculus and beyond)?						
median	0.7 ^a	0.6 ^c	0.6 ^e	14.8	19.2	4.5
range	0-50	0-55	0-45	0-90	0-99	0-80
at the graduate level?						
median	0.8 ^b	0.6 ^d	0.6 ^f	9.9	9.7	0.9 ^g
range	0-36	0-90	0-78	0-99	0-99	0-99

a 206 (78%) had no coursework

b 168 (63%) had no coursework

c 1529 (80%) had no coursework

d 1510 (79%) had no coursework

e 1028 (84%) had no coursework

f 1089 (89%) had no coursework

g 189 (96%) had no coursework

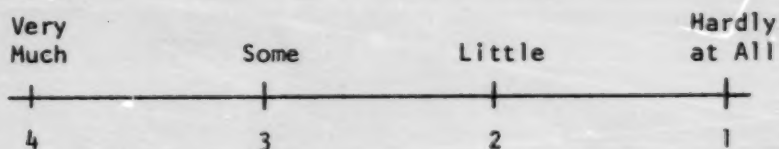
FACTOR 3, Continued

Question	Elementary			Secondary		
	Special Sample (n=265)	OSME Teachers (n=1902)	Non-OSME Teachers (n=1227)	Special Sample (n=103)	OSME Teachers (n=560)	Non-OSME Teachers (n=196)
Check any of the following activities for professional improvement in which you have participated at any time during the past three years.						
25. Another In-State Workshop						
%	15	11	4.5	16	10	5
n	42	211	55	16	59	10
average ¹	3.5	3.0	3.2	2.8	2.8	2.6
26. Out-of-State Conferences or Meetings						
%	9	4	1	16	14	3
n	24	76	17	17	76	5
average	3.3	2.8	2.2	2.8	3.0	2.5
27. Took one or more courses for college credit in mathematics						
%	24	22	13	35	43	22
n	65	427	158	36	242	43
average	3.4	3.1	7.7	2.8	2.9	7.7
28. Took one or more courses for college credit in the teaching of mathematics						
%	41	29	18	42	28	19
n	109	545	223	43	158	37
average	3.5	3.3	3.0	3.2	3.2	3.0

FACTOR 3, Continued

Question	Elementary			Secondary		
	Special Sample (n=265)	OSME Teachers (n=1902)	Non-OSME Teachers (n=1227)	Special Sample (n=103)	OSME Teachers (n=560)	Non-OSME Teachers (n=196)
41. Would you attend future inservice workshops or other activities designed to improve the teaching of mathematics?						
yes	55	43	64	60	41	71
maybe	42	51	32	37	50	28
no	3	6	2	2	9	2

¹ "Average" indicates average ratings of usefulness.



Rating Scale of Usefulness

5. A slightly higher percentage of special sample OSME teachers participated in workshops and college courses when compared to their regular sample OSME counterparts. In particular, special sample OSME teachers tended to take college math courses to improve teaching more often and also tended to give higher ratings for these courses.

6. Nearly all teachers indicated they were likely to attend future workshops designed to improve the teaching of math. Nine percent of secondary teachers from the regular sample OSME group indicated they did not want more workshops in teaching math.

HOW DO OSME AND NON-OSME TEACHERS COMPARE ON PRESERVICE AND INSERVICE EXPERIENCES WHICH ARE RELATED TO OSME?

Respondents were asked a number of questions regarding their involvement in math education in Oregon as well as their participation in inservice experiences that were sponsored by OSME, as shown in Table 10:

1. Special sample OSME teachers were more often members of OCTM, had read periodicals more frequently, and had heard of OSME or OMEC. Regular sample OSME teachers also indicated with regularity membership in OCTM, readership of periodicals, and recognition of their sponsors.

2. Elementary school OSME teachers were less likely to be members of OCTM. While less than half of regular sample OSME teachers claimed to have read math periodicals, 78% of the special sample elementary level teachers claimed readership.

3. Special sample OSME teachers tended to give higher ratings to OSME than regular sample counterparts, and elementary school teachers from both OSME samples tended to give higher ratings than secondary school teachers.

Table 10

A Comparison of OSME and Non-OSME Teachers

FACTOR 4: OSME INSERVICE EXPERIENCES

Question	<u>Elementary</u>			<u>Secondary</u>		
	Special Sample (n=265)	OSME Teachers (n=1902)	Non-OSME Teachers (n=1227)	Special Sample (n=103)	OSME Teachers (n=560)	Non-OSME Teachers (n=196)
16. Are you a member of the Oregon Council of Teachers of Mathematics (OCTM)?						
yes	34	10	2	65	54	14
no opinion	1	1	1	0	1	1
no	65	89	98	35	45	86
17. Do you read and/or use the <u>Math Enthusiast</u> , <u>Arithmetic Teacher</u> , <u>Math Teacher</u> , or <u>OCTM Newsletter</u> ?						
yes	78	47	23	85	80	42
no opinion	0	0	1	2	1	1
no	22	52	76	13	19	57
18. Have you ever heard of the Oregon System of Mathematics Education (OSME) or the Oregon Mathematics Education Council (OMEC)?						
yes	94	58	37	94	77	43
no opinion	0	1	1	0	1	1
no	5	40	63	6	22	56

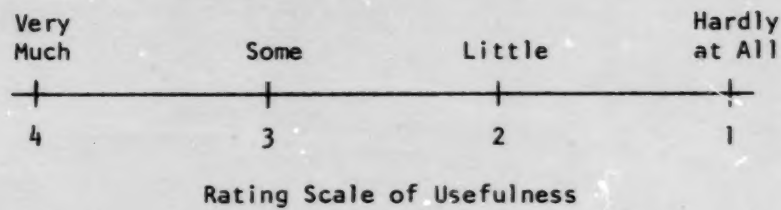
FACTOR 4, Continued

Question	Elementary			Secondary		
	Special Sample (n=265)	OSME Teachers (n=1902)	Non-OSME Teachers (n=1227)	Special Sample (n=103)	OSME Teachers (n=560)	Non-OSME Teachers (n=196)
Ratings of Inservice Experience:						
19. Math Roundup						
%	18	10	-	39	7	-
n	49	180	-	40	205	-
average ¹	3.3	2.9	-	2.8	2.9	-
20. Inservice Math Workshop (during school year)						
%	65	77	-	59	65	-
n	172	1469	-	61	362	-
average	3.5	3.2	-	3.0	3.0	-
21. Inservice Math Workshop (during summer)						
%	24	19	-	33	25	-
n	63	361	-	34	140	-
average	3.6	3.4	-	3.5	3.2	-
22. Math Enthusiasts Program						
%	21	10	-	19	10	-
n	55	199	-	20	56	-
average	3.4	3.1	-	3.0	2.8	-

FACTOR 4, Continued

Question	<u>Elementary</u>			<u>Secondary</u>		
	Special Sample (n=265)	OSME Teachers (n=1902)	Non-OSME Teachers (n=1227)	Special Sample (n=103)	OSME Teachers (n=560)	Non-OSME Teachers (n=196)
23. OSME or OMEC Workshop						
%	47	13	-	57	18	-
n	124	248	-	59	103	-
average	3.6	3.3	-	3.6	3.1	-
24. Computer Workshop						
%	4	4	-	18	14	-
n	11	86	-	18	133	-
average	2.0	2.5	-	2.2	3.0	-

¹ "Average" indicates average ratings of usefulness.



4. Highest average ratings were given to (#21) Inservice Math Workshops (during summer) and (#23) OSME or OMEC Workshops. Computer Workshops were least attended and lowest rated by considerable margins.

HOW ARE OSME AND NON-OSME TEACHERS DIFFERENTIATED WITH RESPECT TO THEIR KNOWLEDGE AND USE OF INSTRUCTIONAL RESOURCES?

A number of questions from the survey dealt with what resources are available and how teachers use instructional resources. The results for Factor 5, Instructional Resources, are displayed in Table 11. The results indicate that:

1. OSME teachers were more likely to be aware of a math resource center in their area than non-OSME teachers.

2. Most teachers, regardless of level or the OSME/non-OSME designation, identified their IED or local district as the source of their math resource centers. Non-OSME teachers were more inclined to identify their IED.

3. Roughly one-half of the elementary school OSME teachers reported using their math resource center, while only 34% of non-OSME teachers reported the same. At the secondary level, teachers were less inclined to use these centers than did non-OSME teachers.

4. About one-fifth of all elementary school teachers and one-half of all secondary school teachers report that calculators are available for classroom use. While elementary level OSME teachers tended to have calculators more often than non-OSME teachers, the difference was slight. At the secondary school level, the difference between OSME and non-OSME was quite substantial--20 percentage points.

Table 11

A Comparison of OSME and Non-OSME Teachers

FACTOR 5: INSTRUCTIONAL RESOURCES

Question	<u>Elementary</u>			<u>Secondary</u>		
	Special Sample (n=265)	OSME Teachers (n=1902)	Non-OSME Teachers (n=1227)	Special Sample (n=103)	OSME Teachers (n=560)	Non-OSME Teachers (n=196)
42. Is there a math resource center in your local area?						
yes	35	44	29	48	49	30
no	40	30	33	35	32	35
don't know	24	26	38	18	20	35
43. IF YES: Where is it located?						
College or University	13	12	13	46	28	24
IED	39	46	54	25	40	42
Local District	42	38	31	27	28	26
Other	6	4	3	2	4	8
44. IF YES: Do you utilize this center?						
yes	50	55	34	36	42	26
no	50	45	66	64	58	74

From Page 3 of Questionnaire

24. Are electronic calculators available for classroom use?						
yes	22	21	15	65	61	40
no	78	79	85	35	39	60

FACTOR 5. Continued

Question	Elementary			Secondary		
	Special Sample (n=265)	OSME Teachers (n=1902)	Non-OSME Teachers (n=1227)	Special Sample (n=103)	OSME Teachers (n=560)	Non-OSME Teachers (n=196)
25. Are they available from						
the classroom?						
% involved	19	15	11	40	53	41
median ¹	1.3	1.3	0.8	4.2	3.5	2.8
range	1-20	1-25	1-34	1-33	1-60	1-60
the students?						
% involved	36	35	27	76	76	75
median	2.8	2.8	2.3	5.0	4.6	2.8
range	1-20	1-30	1-12	1-50	0-70	1-20
the building?						
% involved	30	31	24	65	62	50
median	2.9	3.0	3.7	14.0	10.2	9.8
range	1-30	1-35	1-40	1-60	1-80	1-40
other?						
% involved	15	19	13	11	24	11
median	0.75	1.1	1.2	1.5	11.5	25.0
range	1-2	1-33	1-33	1-2	1-33	1-33

FACTOR 5, Continued

Question	Elementary			Secondary		
	Special Sample (n=265)	OSME Teachers (n=1902)	Non-OSME Teachers (n=1227)	Special Sample (n=103)	OSME Teachers (n=560)	Non-OSME Teachers (n=196)
25. (Cont'd.) Are they available from the district?						
% involved	16	20	11	26	19	14
median	1.5	8.0	4.0	3.0	13.5	7.0
range	1-25	1-99	1-99	1-99	1-99	5-12
26. How often are they used in a class activity? _____ hr/wk						
median	0.8	0.8	0.8	0.9	0.8	0.8
range	1-5	1-99	1-11	1-20	1-99	1-20
27. How are they used? (Check as many as apply)						
for class instruction	4%	4%	2%	22%	19%	8%
an aid to drill and practice	16%	14%	9%	29%	27%	9%
to check their work/answers	15%	14%	9%	44%	42%	26%
in place of paper and pencil	5%	2.5%	1%	27%	18%	11%
outside of the regular classroom	6%	7%	5%	19%	27%	18%
for any aspect of their math work they desire	4%	4%	3%	25%	20%	16%

FACTOR 5, Continued

Question	Elementary			Secondary		
	Special Sample (n=265)	OSME Teachers (n=1902)	Non-OSME Teachers (n=1227)	Special Sample (n=103)	OSME Teachers (n=560)	Non-OSME Teachers (n=196)
27. (Cont'd.) How are they used? (Check as many as apply)						
students must demonstrate ability prior to calculator use	6%	4%	3%	20%	25%	15%
students are not allowed to use calculators	4%	4%	3%	7%	5%	7%
28. Do your students have access to a computer?						
yes	13	159	71	43	244	111
%	6	10	6	56	44	74
29. IF YES, is it						
district?						
yes	3	64	34	11	86	7
%	1	4	3	11	15	4
tabletop?						
yes	5	32	14	13	90	18
%	2	2	1	13	16	9
OTIS?						
yes	3	30	10	4	35	4
%	1	2	1	4	6	3

FACTOR 5, Continued

Question	<u>Elementary</u>			<u>Secondary</u>		
	Special Sample (n=265)	OSME Teachers (n=1902)	Non-OSME Teachers (n=1227)	Special Sample (n=103)	OSME Teachers (n=560)	Non-OSME Teachers (n=196)
29. (Cont'd.) IF YES, is it other?						
yes	3	37	11	8	49	7
%	1	2	1	8	10	5
30. How are they used? (Check as many as apply)						
computer awareness						
yes	10	59	25	20	166	18
%	4	3	2	19	30	9
programming skills						
yes	6	51	30	16	108	11
%	2	3	3	16	19	6
information retrieval						
yes	3	52	28	25	181	22
%	1	3	2	24	33	12
other						
yes	2	40	20	8	79	12
%	1	2	2	8	15	6

1 "Median" indicates median number of calculators used. ³²

5. Teachers indicated that the sources of these calculators were students or the classroom building. Again, OSME teachers at both levels were more inclined to report this availability, and there were also consistently large differences in frequency of reporting between elementary and secondary teachers across all samples, secondary percentages being higher.

6. Secondary school teachers reported with greater frequency how calculators were used. In general, OSME teachers reported with greater frequency on these usages than non-OSME teachers. Among the eight categories describing how calculators could be used, none stood out as prominent at the elementary level. At the secondary level, 42-44% of all OSME teachers reported that students checked their work with their calculators. Overall, both OSME and non-OSME teachers seemed to use calculators in a wide variety of ways.

7. Very few elementary school teachers reported student access to computers (from 6-10% among the samples). At the secondary level, these percentages ranged from a high of 74% for the non-OSME teachers to a low of 44% for the regular sample teachers.

HOW DO OSME AND NON-OSME TEACHERS DIFFER WITH RESPECT TO THE FREQUENCY OF MATH ACTIVITIES IN THEIR CLASSROOMS?

Teachers were compared on the basis of 23 different types of classroom or classroom-related activities that could be conducted as part of the teaching of mathematics. These 23 activities comprise Factor 6. Of these 23, seven can be considered as an emphasis or recommended activities of OSME. If OSME is indeed having an impact on the teachers of mathematics in Oregon, we might expect to see OSME teachers indicate more frequently the

presence of these activities in their classrooms when compared to non-OSME teachers. These results are summarized in Table 12.

A rating of "5" would indicate the most frequent and "1" would be the least frequent, with "3" being the median or middle point:

5-----	4-----	3-----	2-----	1-----
Daily	Several Times a Week	Once a Week	Sometimes	Never

Differences of 0.3 to 0.4 of a point are statistically significant and can be considered as practically significant as well.

Higher indexes, indicating more frequent usage, appear in Table 12 for the special sample OSME teachers on six questions dealing with math games, math lab materials, and manipulatives. Regular sample OSME teachers indicate a slightly lower frequency of usage for these seven questions, while non-OSME teachers from the regular sample indicate the least frequent usage of these activities. This tendency is illustrated in Figure 1 for both elementary and high school teachers. The frequency rates appear highest for elementary school teachers with the exception of Question 6, which deals with the use of calculators and computers in the classroom.

With few exceptions, all other categories show negligible differences among the OSME and non-OSME teachers samples. This would indicate that the OSME teachers are actually implementing math lab materials, math games, and manipulatives with greater frequency and in a wide variety of ways when contrasted with non-OSME teachers. While the effect is more prominent in the elementary school, the differences between OSME and non-OSME teachers was observed for both elementary and secondary school teachers.

It is difficult to evaluate the difference between the two OSME teacher samples. Clearly, special sample OSME teachers have a higher rate

Table 12

A Comparison of OSME and Non-OSME Teachers

FACTOR 6: CLASSROOM ACTIVITIES¹ OF
TEACHERS OF MATHEMATICS

Activity	Elementary			Secondary		
	Special Sample (n=265)	OSME Teachers (n=1902)	Non-OSME Teachers (n=1227)	Special Sample (n=103)	OSME Teachers (n=560)	Non-OSME Teachers (n=196)
MY STUDENTS						
1. take tests or quizzes.	1.5	1.7	1.5	1.7	1.8	1.6
2. work on projects that may take several days to complete and may involve one or more students.	0.9	0.9	0.7	0.8	0.8	0.6
3. do math games, games designed for the purpose of teaching some concept, skill or attitude.	2.1	1.9	1.7	1.3	1.0	0.8
4. do seatwork using commercially-prepared materials, such as handouts or work-books with no help given by me.	1.4	1.5	1.5	1.3	1.9	1.8
5. do seatwork using teacher-made materials such as handouts with no help given by me.	1.4	1.4	1.5	1.3	1.1	1.0
6. use computers or electronic calculators as part of their classwork.	0.3	0.3	0.2	1.1	0.9	0.8
7. do homework assignments (work that must be done either at the student's home or during some school time not set aside or scheduled for mathematics class).	0.7	0.9	0.9	2.4	1.5	2.2
8. work with manipulatives (math lab materials).	2.1	1.7	1.3	1.1	0.9	0.7

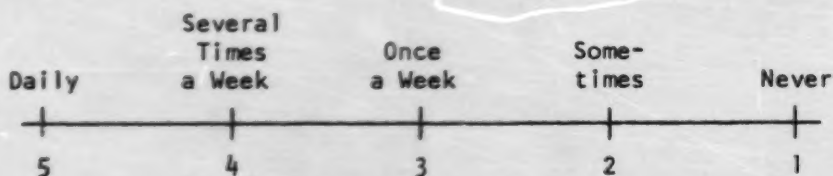
FACTOR 6, Continued

Activity	<u>Elementary</u>			<u>Secondary</u>		
	Special Sample (n=265)	OSME Teachers (n=1902)	Non-OSME Teachers (n=1227)	Special Sample (n=103)	OSME Teachers (n=560)	Non-OSME Teachers (n=196)
MY STUDENTS AND I						
9. have oral presentations with the students involved as the audience.	2.0	2.1	2.2	2.6	2.4	2.5
10. have oral presentations with students and myself involved as the audience.	1.3	1.4	1.3	1.3	1.4	1.5
11. have class discussions with questions and answers.	2.2	2.3	2.3	2.5	2.8	2.9
12. have seatwork with my help using commercially-prepared materials.	2.3	2.4	2.4	2.1	1.9	2.0
13. have seatwork with my help using teacher-made materials.	2.2	2.3	2.3	2.1	2.2	2.2
14. work together with manipulatives (math lab materials).	2.0	1.7	1.3	1.1	0.9	0.8
15. work with manipulatives, with me demonstrating.	1.5	1.3	1.1	0.9	0.8	0.6
16. see or work with audio-visual aids (filmstrips, movies, etc.).	1.0	1.0	0.8	1.8	0.8	0.5
17. do math games (designed for the purpose of teaching some concept, skill or attitude in math which requires my help).	1.8	1.6	1.4	1.1	1.0	0.9
18. work on projects that may take several days but require my help.	0.8	0.8	0.6	0.8	0.7	0.6

FACTOR 6, Continued

Activity	Elementary			Secondary		
	Special Sample (n=265)	OSME Teachers (n=1902)	Non-OSME Teachers (n=1227)	Special Sample (n=103)	OSME Teachers (n=560)	Non-OSME Teachers (n=196)
19. plan math classes or units of instruction for math class.	2.9	2.9	2.9	3.0	3.1	3.1
20. prepare quizzes and tests for math class.	1.4	1.6	1.5	1.9	1.9	1.7
21. prepare materials for students to use in seatwork or as homework	2.2	2.2	2.1	2.2	2.2	2.0
22. prepare math materials (such as games, manipulatives, lab exercises, etc.).	1.8	1.5	1.4	1.3	1.1	0.9
23. correct, score, grade, or record homework, quizzes, or tests.	3.4	3.4	3.4	3.3	3.3	3.4

Activities Rating Scale:



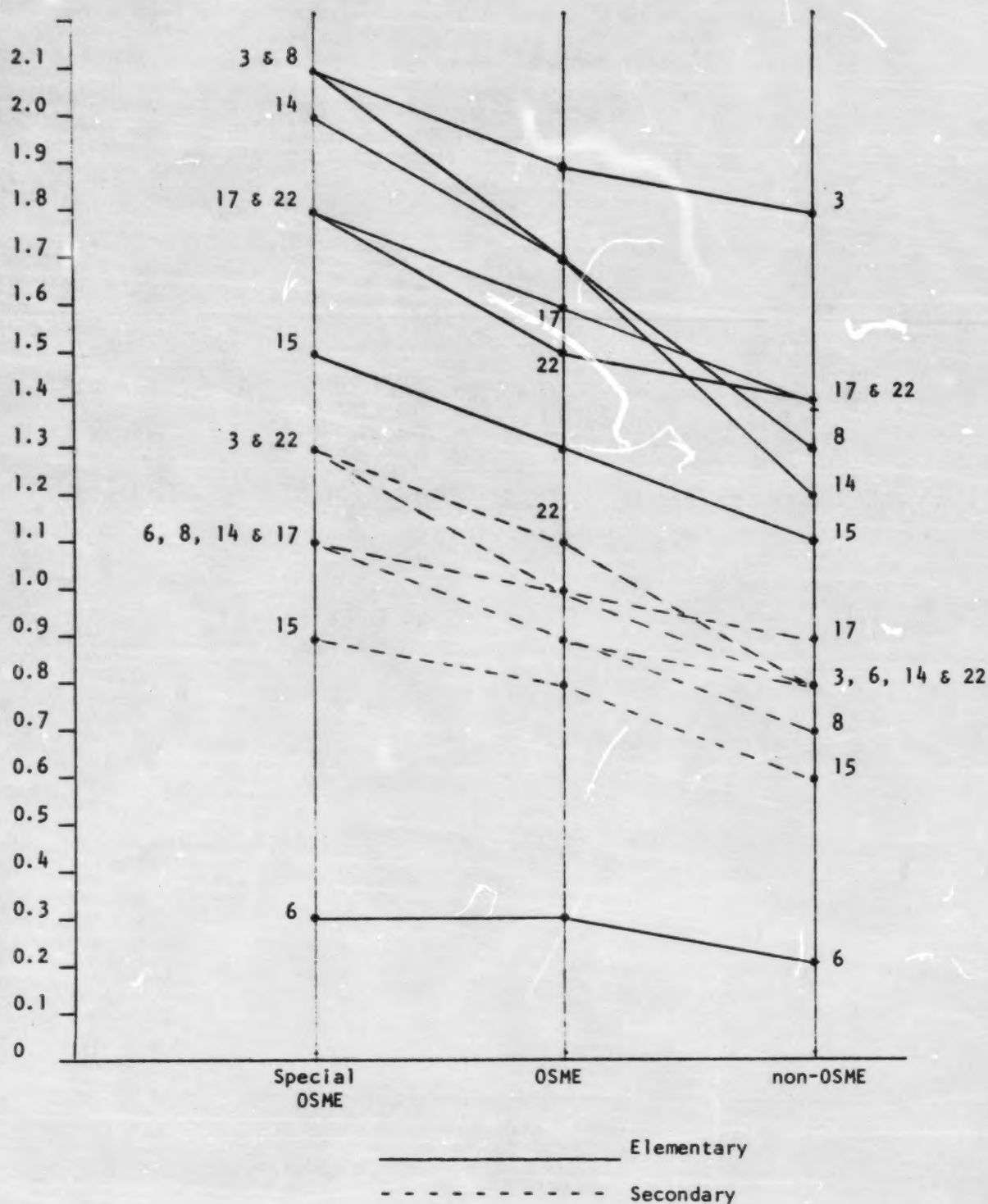


Figure 1. Average ratings of frequency of activities construed to be representative of the philosophy of OSME.

of usage of OSME-type activities. The crux of the issue may lie in how the special sample was conceived and who, exactly, is represented. The use of the special sample was motivated by the question of whether or not OSME participants were properly identifying themselves through the use of Questions 19 to 24 in the survey instrument. The fact that special sample OSME participants did properly respond to the survey instrument and identify themselves as OSME participants suggests that the Questions 19 to 24 were appropriate. Now which sample, special or regular, best represents the population of all OSME participants in the state? Since the regular sample was drawn from all teachers in the state, it appears to have the least potential for bias and is probably the most valid sample from which to generalize. Based on this conclusion, it seems justifiable to assume that OSME teachers have a greater tendency to employ math games, math lab materials, and manipulatives in a number of different ways when compared with non-OSME teachers.

WHAT CONCLUSIONS CAN BE DRAWN FROM THESE DATA?

The analysis conducted with two samples of OSME teachers and one sample of non-OSME teachers revealed a number of findings which are similar to those of two years ago, with one major exception. To summarize, OSME project teachers:

1. are slightly more experienced in teaching and in the teaching of math;
2. have more inservice experience in math;
3. have considerably more undergraduate and graduate training in mathematics;
4. were more often members of OCTM;
5. have read math periodicals with greater frequency;

6. were more familiar with OSME and OMEC;
7. were positively disposed toward their OSME and OMEC experiences; and
8. appeared to implement in their classroom teaching what they had been exposed to as a result of their OSME inservice experience as represented by Questions 1 to 22 on Page 3 of the questionnaire.

The notable difference in these eight findings from this Year V survey and the Year III survey is with #8, the implementation of classroom teaching activities which are reflective of OSME's thrust in mathematics education. Questions 3, 8, 14, 15, 17, and 22 all deal with the use of math games and manipulatives (math lab materials); and, regardless of the OSME sample used, OSME teachers indicated a tendency to employ math games and manipulatives with greater frequency in a wide variety of ways.

In the Year III survey, it was evident that an awareness of OSME and its philosophy was present with nearly 70% of all teachers in the state. The present survey confirms the notion that there still is an awareness; but more so, there is also a willingness to implement some of these innovations in actual classroom instruction. Further, these OSME teachers are not appreciably different from non-OSME teachers with respect to the other 17 indicators of classroom practices, thereby putting the magnitude of this OSME impact into a clearer perspective.

WITHIN THE GROUP OF OSME TEACHERS, CAN USEFUL DISTINCTIONS BE MADE BETWEEN TEACHERS WHO HAVE HAD PROFITABLE VERSUS LESS PROFITABLE OSME EXPERIENCES?

In the survey conducted in 1974-75, the OSME project director, Gene Meier, suggested that those teachers identified as OSME should be subdivided in terms of those who had rated their OSME experiences very highly versus those who had rated OSME very low. It was hypothesized that this analysis

would reveal findings about the types of teachers of math who profit from the inservice experiences of OSME. This analysis was conducted again this year to determine if the tendencies detailed earlier still existed. These results are discussed, as in the earlier comparisons, by the 6 factors. For the sake of brevity and readability, all Tables pertaining to these analyses are presented in Appendix A.

Factor 1 - Current Status of Teachers of Mathematics in Oregon

As shown in Table 13, teachers in the high group, that is, teachers who rated their OSME experiences as "most useful," were slightly more experienced than those teachers rating their OSME experiences as "least useful," (hence designated as "low group"). Although these high group teachers were slightly more experienced, they were shown to teach mathematics about as often as those in the low group.

Factor 2 - Teachers' Satisfaction with Mathematics Resources and Instructional Materials

The breakdown of high group and low group teachers for Factor 2 is given in Table 14. In general, high group teachers appear to be more desirous of using math resources, but are very similar to the teachers in the low group in the other three questions of Factor 2. Thus there is little to distinguish among high and low group teachers in terms of the degree of desirability of new textbooks, or whether or not a textbook is used to teach math.

Factor 3 - Preservice and Inservice Experiences (Non-OSME Related)

1. Elementary level high group teachers tended to be educated outside of the Northwest, while low group teachers tended to come more from

EOSC and Northwest private schools. At the secondary level, high group teachers were most often from OSU.

2. Ratings of the adequacy of preservice education was constant across all high group and low group samples, but secondary level teachers from both groups tended to rate their preservice experiences more highly.

3. Both elementary and secondary high group teachers tended to take more inservice math workshops. Secondary level high group teachers had more inservice time than elementary level teachers from the high group.

4. While high group teachers had about the same amount of course work at the 100-200 level, differences began to show at the secondary school level for 300-400 level courses and graduate level courses. Differences between high and low groups at the elementary level were non-significant. In fact, very few elementary school teachers reported any coursework at the 300-400 level and beyond.

5. High group teachers tended to participate more often in non-OSME inservice activities and gave higher ratings of usefulness to each of the categories given. Within the high group, the elementary school teachers tended to give higher ratings to instate workshops, while secondary school teachers gave higher ratings to out-of-state workshops.

6. High group teachers, both elementary and secondary, were far more desirous of future workshops when compared to low group teachers.

The above results are included in Table 15.

Factor 4 - OSME Inservice Experiences

High group and low group teacher comparisons on Factor 4 are shown in Table 16.

1. High group teachers were typically more often members of OCTM, read math periodicals more often, and had heard of OSME or OMEC.

2. Secondary level high group teachers seem far more aware of OSME and are more involved in OCTM than their elementary counterparts. Only 15% of high group elementary teachers reported OCTM membership.

3. As might be expected, teachers who were identified as high group based on rating in one OSME activity tended to rate other OSME activities highly, while those rating OSME very low also rated other OSME activities very low.

4. Elementary level high group teachers tended to give slightly higher ratings of usefulness than secondary level teachers, the reverse being true for low group teachers.

Factor 5 - Instructional Resources

1. Both elementary and secondary high group teachers had a slightly greater tendency to know about math resource centers in their area.

2. High group teachers were also more inclined to use their resource centers, elementary teachers more so than secondary.

3. Roughly the same proportions of high and low group teachers reported the availability of calculators for classroom use. High school teachers reported this availability more often.

4. Patterns of availability were different between high and low groups in an unsystematic manner.

5. Of the few teachers from either high or low groups who indicated using a computer, high group teachers reported with greater frequency as to where computers were available, although there were no large differences

in proportions of teachers from each group who have access to computers. Generally, high school teachers in both high and low groups have more access.

7. Both elementary and secondary level high group teachers indicated more frequent usage of computers for special purposes, i.e., awareness, programming, information retrieval.

These factor 5 findings are indicated in Table 17.

Factor 6 - Classroom Activities of Teachers of Mathematics

As might be expected when comparing OSME and non-OSME teachers we should observe differences in reports of ratings of frequency for Questions 3, 6, 8, 14, 15, 17 and 22. These differences may be observed in Table 18. For the most part, this expectation is confirmed with the exception of Question 15, where a very slight difference was found. In general, high group teachers are more willing to implement what they acquire from OSME activities in their regular teaching. As in the case with the previous analysis where OSME and non-OSME teachers were compared, seldom were differences observed for other categories of teacher and student activity. In many instances, these differences were of very minor magnitude.

HOW DO THE RESULTS OF THIS SURVEY CONTRAST AND COMPARE WITH THOSE OF THE SURVEY CONDUCTED TWO YEARS EARLIER?

As part of the final evaluation activities of OSME, a final report will be completed which makes comparisons, where appropriate, between results of this survey and an earlier one. The survey conducted in the school year 1974-75 revealed a widespread awareness of teachers for OSME but a lack of implementation of teaching techniques associated with OSME's approach to math instruction. This year's study, with minor changes in the sampling procedure and the acquisition of a sample of verified OSME teachers, reveals

a sizable impact which may be reasonably attributed to the efforts of OSME. These comparisons will be made and described in this third and final report on the Oregon Survey of Teachers of Math, which documents the impact of OSME on teachers of math in Oregon.

APPENDIX A
Tables of High Group and
Low Group Comparisons for the
Six Factors of the Survey

Table 13

A Comparison of Two Different Groups of OSME-Project Teachers

FACTOR 1: CURRENT STATUS OF TEACHERS OF MATHEMATICS IN OREGON

<u>Question</u>	<u>Elementary</u>		<u>Secondary</u>	
	<u>Most Useful</u>	<u>Least Useful</u>	<u>Most Useful</u>	<u>Least Useful</u>
3. How many years have you been teaching?				
mean	12.7	11.4	16.3	13.2
range	0-55	0-43	0-55	0-39
4. In how many of those years did you teach mathematics as a discipline or subject matter content?				
mean	10.3	9.5	14.1	11.3
range	0-54	0-43	0-55	0-39
8. How often do you teach mathematics?				
one period				
a day	86%	90%	13%	15%
several times				
a day	10%	9%	13%	7%
half day	1%	0%	13%	14%
full time	2%	1%	62%	65%

Table 14

A Comparison of Two Different Groups of OSME-Project Teachers

FACTOR 2: TEACHERS' SATISFACTION WITH MATHEMATICS
RESOURCES AND INSTRUCTIONAL MATERIALS

<u>Question</u>	<u>Elementary</u>		<u>Secondary</u>	
	<u>Most Useful</u>	<u>Least Useful</u>	<u>Most Useful</u>	<u>Least Useful</u>
12. In your opinion, in the district where you teach, are the resources and aids for teaching mathematics adequate?				
yes	69	70	71	72
no opinion	4	4	6	7
no	27	25	22	21
13. Do you desire additional math resources (e.g., filmstrips, films, commercially-prepared materials)?				
yes	60	52	61	50
no opinion	7	7	7	6
no	34	40	32	44
14. Do your students have a basic textbook in mathematics?				
yes	86	89	93	93
no opinion	0	1	1	0
no	14	9	6	7
15. If yes, do the present mathematics textbooks need revision or replacement?				
yes	71	71	70	72
no opinion	5	8	5	4
no	23	22	24	23

Table 15

A Comparison of Two Different Groups of OSME-Project Teachers

FACTOR 3: PRESERVICE AND INSERVICE EXPERIENCES
(NON-OSME RELATED)Question

1. Where did you obtain your undergraduate education?

	EOSC	OCE	OIT	OSU	PSU	UO	SOSC	NW Private School	Other NW School	School Outside the NW
<u>Elementary</u>										
Most Useful ¹	8	21	0	10	7	8	9	6	6	24
Least Useful	11	21	0	12	7	6	11	10	4	18
<u>Secondary</u>										
Most Useful	7	11	3	21	7	11	3	8	9	22
Least Useful	6	10	0	13	8	10	5	10	9	30

2. To what degree did your preservice education prepare you to teach mathematics?

	quite well 4	well 3	adequately 2	inadequately 1	AVERAGE
<u>Elementary</u>					
Most Useful	12	14	48	24	2.2
Least Useful	11	15	47	27	2.1
<u>Secondary</u>					
Most Useful	15	26	38	19	2.4
Least Useful	15	23	45	17	2.4

FACTOR 3, Continued

Question

9. Over the years you have been teaching, what is your estimate of the average number of days each year that you have spent in inservice training in mathematics?

	less than one day	one day	two days	more than two days
<u>Elementary</u>				
Most Useful	24	21	16	39
Least Useful	39	23	16	22
<u>Secondary</u>				
Most Useful	14	17	22	46
Least Useful	20	28	21	31

10. Approximately how many credit hours do you have in college math courses numbered:

	100-200		300-400		400-500	
	median	range	median	range	median	range
<u>Elementary</u>						
Most Useful	3.4	0-80	0.1	0-55	0.2	0-90
Least Useful	2.7	0-48	0.1	0-35	0.1	0-84
<u>Secondary</u>						
Most Useful	11.2	0-80	19.9	0-99	12.1	0-87
Least Useful	11.2	0-99	13.5	0-99	7.8	0-80

FACTOR 3, Continued

Question

Rate the degree to which you have applied or used the ideas presented at any professional improvement activity in which you participated.

	%	N	very much	some	little	hardly at all	AVERAGE
25. Another In-State Workshop							

Elementary

Most Useful	12	98	53	22	8	17	3.1
Least Useful	4	11	3	11	7	79	1.4

Secondary

Most Useful	8	19	32	34	20	14	2.8
Least Useful	8	10	4	18	15	63	1.6

26. Out-of-State Conferences or Meetings

Elementary

Most Useful	6	48	46	18	4	32	2.8
Least Useful	2		3	4	1	92	1.2

Secondary

Most Useful	16	36	44	33	9	14	3.1
Least Useful	9	11	6	22	8	63	1.7

27. Took one or more courses for college credit in mathematics.

Elementary

Most Useful	22	182	50	36	8	6	3.3
Least Useful	11	33	8	31	10	51	2.0

Secondary

Most Useful	38	88	47	35	9	8	3.2
Least Useful	28	35	28	33	9	30	2.6

FACTOR 3, Continued

Question

Rate the degree to which you have applied or used the ideas presented at any professional improvement activity in which you participated.

	%	N	very much	some	little	hardly at all	AVERAGE
28. Took one or more courses for college credit in the teaching of mathematics.							

Elementary

Most Useful	30	246	63	27	5	5	3.5
Least Useful	10	29	15	25	10	51	2.0

Secondary

Most Useful	29	67	54	33	6	7	3.3
Least Useful	22	28	20	35	10	35	2.4

41. Would you attend future inservice workshops or other activities designed to improve the teaching of mathematics?

	yes	maybe	no
--	-----	-------	----

Elementary

Most Useful	69	30	1
Least Useful	42	50	9

Secondary

Most Useful	70	29	1
Least Useful	39	55	6

1 Usefulness Rating Scale:

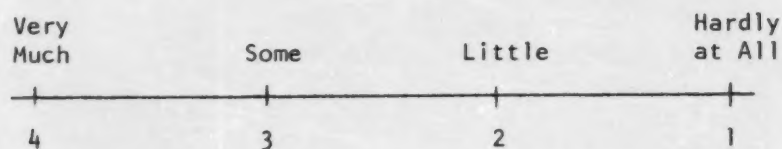


Table 16

A Comparison of Two Different Groups of OSME-Project Teachers

FACTOR 4: OSME INSERVICE EXPERIENCES

Question	<u>Elementary</u>		<u>Secondary</u>	
	<u>Most Useful¹</u>	<u>Least Useful</u>	<u>Most Useful</u>	<u>Least Useful</u>
16. Are you a member of the Oregon Council of Teachers of Mathematics (OCTM)?				
yes	15	6	60	44
no opinion	1	0	2	56
no	84	94	39	0
17. Do you read and/or use the <u>Math Enthusiast</u> , <u>Arithmetic Teacher</u> , <u>Math Teacher</u> , or <u>OCTM Newsletter</u> ?				
yes	59	35	85	66
no opinion	41	0	0	2
no	0	64	15	33
18. Have you ever heard of the Oregon System of Mathematics Education (OSME) or the Oregon Mathematics Education Council (OMEC)?				
yes	66	49	80	71
no opinion	32	50	0	2
no	1	1	20	27

CHECK ANY OF THE FOLLOWING ACTIVITIES FOR PROFESSIONAL IMPROVEMENT IN WHICH YOU HAVE PARTICIPATED AT ANY TIME DURING THE PAST THREE YEARS.

19. Math Roundup				
%	11	4	36	23
N	91	11	83	29
Average	3.2	1.5	3.2	1.7

FACTOR 4, Continued

<u>Question</u>	<u>Elementary</u>		<u>Secondary</u>	
	<u>Most Useful</u>	<u>Least Useful</u>	<u>Most Useful</u>	<u>Least Useful</u>

CHECK ANY OF THE FOLLOWING ACTIVITIES FOR PROFESSIONAL IMPROVEMENT IN WHICH YOU HAVE PARTICIPATED AT ANY TIME DURING THE PAST THREE YEARS.

20. Inservice Math Workshop (during school year)

%	66	30	53	37
N	537	91	124	46
Average	3.8	1.8	3.5	2.1

21. Inservice Math Workshop (during summer)

%	24	7	32	21
N	200	21	74	26
Average	3.7	1.6	3.6	2.0

22. Math Enthusiasts Program

%	15	4	10	8
N	121	13	23	10
Average	2.3	1.4	3.0	1.5

23. Oregon System of Mathematics Education (OSME) or Oregon Mathematics Education Council (OMEC) Workshop

%	21	3	22	12
N	170	8	52	15
Average	2.5	1.3	3.3	1.7

FACTOR 4, Continued

<u>Question</u>	<u>Elementary</u>		<u>Secondary</u>	
	<u>Most Useful</u>	<u>Least Useful</u>	<u>Most Useful</u>	<u>Least Useful</u>
CHECK ANY OF THE FOLLOWING ACTIVITIES FOR PROFESSIONAL IMPROVEMENT IN WHICH YOU HAVE PARTICIPATED AT ANY TIME DURING THE PAST THREE YEARS.				
24. Computer Workshop				
%	4	7	29	17
N	34	21	68	21
Average	2.6	1.2	3.2	1.7

1 Usefulness Rating Scale:

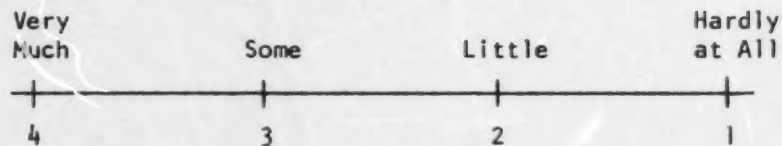


Table 17

A Comparison of Two Different Groups of OSME-Project Teachers

FACTOR 5. INSTRUCTIONAL RESOURCES

Question	<u>Elementary</u>		<u>Secondary</u>	
	<u>Most Useful¹</u>	<u>Least Useful</u>	<u>Most Useful</u>	<u>Least Useful</u>
42. Is there a math resource center in your local area?				
yes	46	36	53	50
no	33	29	35	31
don't know	21	34	13	19
43. IF YES:				
Where is it located?				
College or University	12	9	36	27
IED	43	41	32	40
Local District	40	46	26	33
Other	4	4	6	0
44. IF YES:				
Do you utilize this center?				
yes	68	43	54	45
no	32	57	46	55

Page 3 of Questionnaire:

24. Are electronic calculators available for classroom use?

yes	24	16	60	58
no	76	84	40	42

FACTOR 5, Continued

<u>Question</u>	<u>Elementary</u>		<u>Secondary</u>	
	<u>Most Useful</u>	<u>Least Useful</u>	<u>Most Useful</u>	<u>Least Useful</u>
25. Are they available from				
the classroom?				
%	30	37	55	68
median	1.3	1.8	2.8	4.3
range	1-21	1-25	1-30	1-30
the building?				
%	75	43	60	62
median	2.4	7.0	2.4	5.0
range	1-30	1-25	1-40	1-50
the district?				
%	52	87	71	52
median	3.5	2.7	10.7	12.6
range	1-31	1-25	1-80	1-50
the students?				
%	22	11	9	7
median	1.7	1.0	13.0	30.0
range	1-33	1-3	1-33	1-31
28. Do your students have access to a computer?				
yes	11	11	56	50
no	89	89	44	50
		56		

FACTOR 5, Continued

<u>Question</u>	<u>Elementary</u>		<u>Secondary</u>	
	<u>Most Useful</u>	<u>Least Useful</u>	<u>Most Useful</u>	<u>Least Useful</u>
29. If YES, is it				
district?				
yes	34	12	31	20
%	4	4	13	16
tabletop?				
yes	16	7	40	19
%	2	2	18	15
OTIS?				
yes	12	9	13	10
%	2	3	6	8
other?				
yes	16	2	22	9
%	2	1	9	7
30. How is the computer used?				
computer awareness				
yes	27	6	71	43
%	3	2	30	34

FACTOR 5, Continued

<u>Question</u>	<u>Elementary</u>		<u>Secondary</u>	
	<u>Most Useful</u>	<u>Least Useful</u>	<u>Most Useful</u>	<u>Least Useful</u>
30. (Cont'd.) How is the computer used?				
programming skills				
yes	25	6	47	33
%	3	2	20	26
information retrieval				
yes	30	9	78	44
%	4	3	34	35
other				
yes	22	6	42	10
%	3	2	20	8

1 Usefulness Rating Scale:

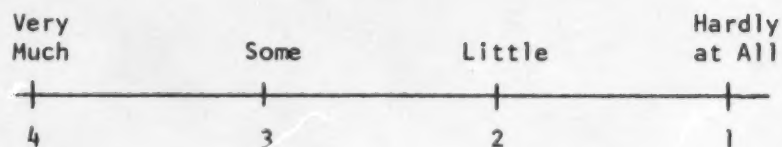


Table 18

A Comparison of Two Different Groups of OSME-Project Teachers

FACTOR 6: CLASSROOM ACTIVITIES OF
TEACHERS OF MATHEMATICS

<u>Activity</u>	<u>Elementary</u>		<u>Secondary</u>	
	<u>Most Useful¹</u>	<u>Least Useful</u>	<u>Most Useful</u>	<u>Least Useful</u>
MY STUDENTS				
1. take tests or quizzes.	3.3	3.3	3.3	3.3
2. work on projects that may take several days to complete and may involve one or more students.	4.0	4.1	4.1	4.2
3. do math games, games designed for the purpose of teaching some concept, skill or attitude.	2.9	3.2	3.9	3.9
4. do seatwork using commercially-prepared materials, such as handouts or work-books with no help given by me.	3.4	3.5	3.9	4.1
5. do seatwork using teacher-made materials such as handouts with no help given by me.	3.5	3.5	3.7	3.9
6. use computers or electronic calculators as part of their classwork.	4.6	4.7	4.1	4.1
7. do homework assignments (work that must be done either at the student's home or during some school time not set aside or scheduled for mathematics class).	4.1	3.9	2.6	2.6
8. work with manipulatives (math lab materials).	3.0	3.5	4.2	4.2

FACTOR 6, Continued

<u>Activity</u>	<u>Elementary</u>		<u>Secondary</u>	
	<u>Most Useful</u>	<u>Least Useful</u>	<u>Most Useful</u>	<u>Least Useful</u>
MY STUDENTS AND I				
9. have oral presentations with the students involved as the audience.	2.9	2.9	2.5	2.6
10. have oral presentations with students and myself involved as the audience.	3.6	3.6	3.5	3.6
11. have class discussions with questions and answers.	2.7	2.6	2.2	2.2
12. have seatwork with my help using commercially-prepared materials.	2.7	2.6	3.2	3.2
13. have seatwork with my help using teacher-made materials.	2.6	2.7	2.6	3.0
14. work together with manipulatives (math lab materials).	3.1	3.6	3.9	4.2
15. work with manipulatives, with me demonstrating.	3.6	3.7	4.1	4.2
16. see or work with audio-visual aids (filmstrips, movies, etc.).	3.9	4.0	4.2	4.1
17. do math games (designed for the purpose of teaching some concept, skill or attitude in math which requires my help).	3.2	3.5	3.8	4.0
18. work on projects that may take several days but require my help.	4.2	4.2	4.2	4.2

FACTOR 6, Continued

Activity	Elementary		Secondary	
	Most Useful	Least Useful	Most Useful	Least Useful
19. plan math classes or units of instruction for math class	2.1	2.2	1.8	1.9
20. prepare quizzes and tests for math class.	3.4	3.3	3.0	3.0
21. prepare materials for students to use in seatwork or as homework.	2.8	2.8	2.7	2.7
22. prepare math materials (such as games, manipulatives, lab exercises, etc.).	3.3	3.6	3.7	3.9
23. correct, score, grade, or record homework, quizzes, or tests.	1.6	1.6	1.7	1.8

1 Usefulness Rating Scale:

